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12 January 1981

Worldwide Report

ENVIRONMENTAL QUALITY

(FOUO 1/81)

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INTERNATIONAL AFFAIRS

BURNING OF CHEMICAL WASTES IN NORTH SEA CAUSES PROBLEMS

Hamburg STERN in German 30 Oct 80 pp 240-242

[Text] "We're nothing but highly paid trash collectors. I can't blame sailors if they call us 'leper ships.' This is s stinking job, and I can't wait for the day when I can leave this ship." Rolf Pichstein need wait no longer: since making this statement he has given up his job as captain of the "Vulcanus," one of the three waste-burning ships in the North Sea. However, he no longer wishes to acknowledge his critical comments made to a British journalist, because in the future Pichstein will again be working as a captain for the Hansa Shipping Company in Bremen, to which, among other ships, the "Vulcanus" belongs.

The ship can be recognized from a distance by its plume of white smoke which extends for kilometers, fitfully illuminated with red at night by its two incinerators and which sometimes causes ships to hurry to lend assistance to what seems to be a burning tanker. Most captains, however, made a wide detour around the international combustion area, which lies at 54 degrees 15 minutes north and 3 degrees 50 minutes east, some 100 nautical miles off the Dutch coast. It is to this spot that the "Vulcanus," which sails under the official flag of Singapore, and the German waste-disposal ships "Matthias II" and "Vesta" slowly head under their plumes of white smoke consisting mainly of poisonous and corrosive hydrochloric acid mist.

The ships' poisonous cargo consists for the most part of chlorinated hydrocarbons. The world's chemical industries manufacture more than 30 million metric tons of these annually, as solvents or as raw materials for other products. The amount of waste from these toxins is correspondingly large and is in general decomposed only very slowly in nature. Many of these materials are actually enriched in the food chain, such that fish can end up containing up to a thousand times more toxin than seawater.

The environment is becoming more and more polluted with great quantities of chlorinated hydrocarbons, although the most active of these can be eliminated by burning at temperatures around 1400 degrees centigrade--to carbon dioxide, steam and hydrochloric acid. The hydrochloric acid is the reason why the toxic wastes are preferably burned far out at sea, since waste-burning plants on land would have to wash the corrosive acid from their exhaust gases and then neutralize it, which is very expensive.

Every year the three ships hauling the toxic waste burn more than 130,000 metric tons of the chocolate-brown, foul-smelling waste, thereby putting some 40,000 tons of hydrochloric acid and 130 tons of uncombusted chlorinated hydrocarbons into the air of the sea off the coast of Holland.

According to Scandinavian environmentalists, however, the prevailing southwesterly winds carry the corrosive load as far as Denmark, Norway and Sweden, where it precipates as acid rain and further destroys soils and bodies of water which are already excessively acidic. On the other hand, Prof Klaus Grasshoff, a marine scientist from Kiel, argues that the clouds of hydrochloric acid sink to the water only a few hundred meters from the ship, and the acid is then quickly neutralized in the seawater. In any case, the combustion ships operate about two-thirds cheaper than plants on land, since they avoid costs of some 150 marks per ton for neutralization.

It would be even cheaper, however, simply to pump the toxic waste into the sea, as the Bayer Co. and the Kronos titanium plant at Nordenham have done for years with their sulfuric acid-containing waste. But with chlorinated hydrocarbons, which are far more dangerous, such a method would mean the rapid annihilation of all life in the North Sea. Officials therefore routinely sail with the trash ships, and in addition a sealed, automatic analyzer monitors the trash pumps, the combustion and the ships' position. The analytical results are recorded on film and checked on land.

The ships sailing under the German flag are under the supervision of the German Hydrographic Institute (DHI) in Hamburg; Dutch and Belgian officials monitor the "Vulcanus." But German laws are stricter. "We get the exact chemical analyses of the waste before it is burned at sea at all," explained Niels Peter Ruehl of the DHI. "In no instance is the waste allowed to contain DDT, PCB or hexachlorobenzene, which are particularly persistent environmental poisons, and certainly not TCDD, the extremely toxic and mutagenic poison released at Seveso."

As of now there are no analyses which confirm the definite annihilation of these compounds at the temperatures employed. Instead, industry is supposed to build its own combustion plants for such poisons, using high temperatures at which even these stable molecules are broken down.

But such plants are expensive. Therefore several companies, with official tolerance, are preferring a cheaper solution; they load their trash into tank cars and transport it cross-country by rail to Antwerp to the "Volcanus," which sails under the flag of Singapore and to which German laws do not apply. Thus, for example, the Boehringer Ingelheim Chemical Co. of Hamburg, which has already been cited many times as an environmental polluter, sends the "Vulcanus" TCDD-containing wastes formed during the annual production of 1,500 tons of the herbicide 2,4,5-T.

The highly potent 2,4,5-T achieved dubious renown as a defoliant (Agent Orange) in the Vietnam war. It always contains the extremely poisonous mutagen TCDD as an impurity; its use is therefore forbidden in Italy, Sweden and the Netherlands.

Wolfgang Curilla, environmental councillor in Hamburg, long ago forbade his gardeners to use this compound and is now seeking to obtain a ban on its use throughout Germany. Boehringer's neighbors and several citizens' committees in Hamburg are demanding more: a general ban on 2,4,5-T manufacture, so that the toxic wastes are not even formed in the first place.

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FRANCE

RESULTS REVIEWED OF EFFORTS TO 'CLEAN UP' FRANCE

Paris VALEURS ACTUELLES in French 4 Aug 80 pp 25-27

/Article by Francois Lebrette: "The Invasion of Cleanliness"/

/Text/ A cleaner France in the year 2000 than under Napoleon: pollution has already become a symptom of industrial underequipment.

"Salmon is a symbol of our action," says Francois Delmas, secretary of state to the minister of environment. "When it returns in a river, it is because the water has again become clean. All action taken by the state, local communities and industrialists immediately shows up in a tangible result."

Tangible but still flimsy. During the first 6 months of 1980, almost 5,000 salmon were caught in French rivers compared with less than 2,000 all last year. However, we are still far from the figure for 1975 (7,500 caught) and still farther from that of 1955 (35,000).

As for estimates made by the National Institute of Agronomic Research for the 18th century, they give us food for thought: 45,000 caught annually in Brittany alone; double that amount, if we count Nantes. That was when leasing contracts stipulated that one could not serve salmon to servants more than two or three times per week.

For the first time in two centuries, the trend is reversing. Still timidly, but studies give cause for a certain degree of optimism: between now and 1990 we should get back to the 35,000 caught in 1955.

"This goal is completely realistic," Mr Delmas asserts. "And it is one which would net us a saving in currency of 25 million francs."

However, even though salmon is a symbol of decreasing pollution, it gives only a limited idea of the prodigious revolution occurring at this very moment: in 10 years the polluting of waterways has decreased 35 percent; in the year 2000 it should have returned to the level of the year 1800.

To measure the variations in pollution, it was necessary to invent a new unit of measurement--namely, the "inhabitant-equivalent" (e-h), corresponding

to a daily discharge of 147 grams of waste into 200 liters of water. This waste decomposes into "matter in suspension" and "oxidizable matter" of chemical and organic origin.

In 1970, raw pollution, before treatment, reached 130 million e-h. After treatment, the residual pollution actually discharged into waterways and onto shores still amounted to 110 million e-h. Raw pollution has now climbed to 160 million e-h, but the actual pollution has fallen back to 70 million.

The objective for 1995: to treat 85 percent of the raw pollution. The perspective for the year 2000: 220 million e-h before treatment, 30 million after. In other words, 30 years of growth will have multiplied the waste by two but divided the material actually discharged by four.

In 1800, France had 28 million inhabitants, an emerging industry and a faltering system for combating pollution. Certainly, Simon Lacordaire recalls in "The Resurrection of the Waters" (Fayard), as early as 1756, "the dye works and tanneries installed along the Bievre were obliged to haul away the residue from their trade in a dumpcart." But a century later, the Bievre had become a sewer.

We can then calculate that at the beginning of the 19th century water pollution was already reaching 35 million e-h. This is more than the goal set for the beginning of the 21st century.

This reversal, as rapid as it is spectacular, has required an unprecedented financial effort. Harbor financial agencies are devoting 1 billion francs annually to the fight against pollution. "As a whole," the Ministry of Environment states, "cleaning up the water requires an annual expenditure of 2.5 billion francs for investments and 1.5 billion for operating the installations."

"In 10 years," Mr Delmas observes, "communal purification stations have increased from 1,500 to 8,000, that is, 6 million e-h installed per year or, stated in another way, one station set up or revamped per day.

The program is proceeding full-speed. On 16 June, Michel d'Ornano and Gaston Defferre, mayor of Marseille, gave the final touches to the project for cleaning up the Provence-Cote d'Azur shoreline. This will cost more than 1.5 billion francs over the next 10 years.

Example of obstacles to overcome: Marseille, France's second-largest city, is still without purification stations. At the bottom of a mountainous amphitheater, the city scarcely offers any terrains suitable for such an installation, which explains why nothing has yet been done. Therefore, it will be necessary to divide the station into three parts.

An initial pretreatment plant will be installed underground, under the Michelet stadium. This plant will perform the function of the three D's: decantation, degreasing and disintegration (first filtering). Next, the slush will be conveyed to a retreatment plant, to be built in a quarry located near the massif classed as the Calanques--a characteristic example of the contradictions inherent in environmental protection. Lastly, it will be necessary to add a water-treatment plant to the first two, and the site for this facility has not yet been selected.

"The entire purification system will be in operation in less than 10 years," it is being said at the Ministry of Environment.

Estimated cost: 800 million francs, or three or four times the normal cost. But France's overall pollution--and that of its shores--will drop several million units at one time.

Simultaneously, the effort to combat industrial pollution is continuing. The most spectacular results of that effort have shown up near Marseille at the gulf of Fos and Berre Lagoon.

Between 1972 and 1979, pollution in that area decreased 90 percent. Hydrocarbon waste decreased from 6.4 tons per day to less than 0.4 ton; annual mercury waste dropped from 3,290 kg in 1972 to 265 kg in 1978.

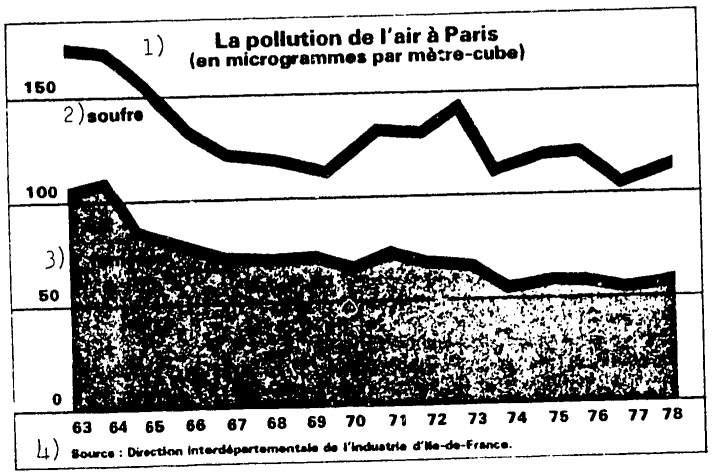
An obvious paradox: the decrease in pollution in the Fos-Berre area has coincided with massive industrialization: Solmer, Ugine-Aciers, Imperial Chemical Industries, Produits Chimiques Ugine-Kuhlmann and the like. At the Ministry of Environment this is explained as follows:

"Investments necessary for combating pollution are obviously more easily integrated in an overall investment plan than added to an installation which is already old."

Henceforth, pollution is a sign of industrial old age. With increasing frequency modern plants even avoid producing raw pollution which they would then have to retreat; they prefer to make waste recovery a part of their manufacturing process. A new industrial principle: all waste is a loss.

Thus, the most modern sugar refineries recover all of the sewage formerly discharged into streams. Once dried, the beet pulp is resold as cattle feed. In Champagne the latest refinery of the Beghin group channels the liquid waste back into the fields where it serves as natural fertilizer.

Pollutions several thousand years old are disappearing. Since the neolithic revolution the washing of raw wool has always involved discharging the 40 percent impurities of which it is composed into streams: sand, soil, wool fat, grease and vegetable matter. And in conventional plants, despite the recovery of 50 percent of the wool grease, pollution for each ton washed exceeds 2,000 e-h and "consumes" 13 cubic meters of water.



Key:
1. Air Pollution in Paris (in micrograms per cubic meter)
2. Sulfur
3. Smoke
4. Source: Interdepartmental Directorate of Ile-de-France Industry

In the Dewavrin plant in Auchel (Pas-de-Calais) a new system has been installed. Results: raw pollution reduced to zero, while water consumption dropped to 0.3 cubic meter per ton. Better yet: the burning of the collected waste furnishes 90 percent of the power required by the new system.

At this technological stage, the word "depollution" should give way to the word "recycling"; it is no longer a question of an expense but rather of a saving.

The Nord-Artois-Picardie basin agency has estimated that a conventional retreatment system (that is, the purification of raw pollution) would have cost the wool-washing plant about 30 million francs in investments and an additional 2 million francs per year in operating expenses. The new system has cost only 13 million francs and an annual expenditure of 1.35 million.

The same basin agency gives 22 examples of new "cleaning techniques" in its area, based on the recycling and re-evaluation of waste, and more economical than conventional depollution. This is true in the case of the electrolytic recovery of copper trapped in potato proteins in passing through the recycling of brewery filters: just in the Pelforth brewery of Mons-en-Baroeul the saving in pollution is equal to the waste of a city of 5,000 inhabitants.

The recycling strategy is becoming a part of our customs. The next step: beginning 23 November, it will be obligatory to collect and regenerate used

mineral oil. It is estimated that more than 60,000 tons of motor oil are currently discarded or burned. It so happens that, upon contact with motor fuels, those oils have become loaded with lead. On the whole, 300 tons of lead would thus be dispersed throughout the environment each year.

The yield from regeneration is 70 percent. In other words, 100 tons of used oil can furnish 70 tons of clean oil, diesel oil and gasoline. And the power necessary to run the system is wholly supplied by the tar contained in the 30 percent waste. Results of the operation: depollution and a monetary saving of about 1,200 francs per ton, corresponding to the value of oil imports thus avoided.

Certainly, all is not resolved. Substantial sources of pollution remain, the problem of heavy metals is not completely settled, and the risks of accidental discharges are still present. Moreover, it is not enough to have retreatment plants; we must also have a maximum number of waste-collecting facilities connected to those plants.

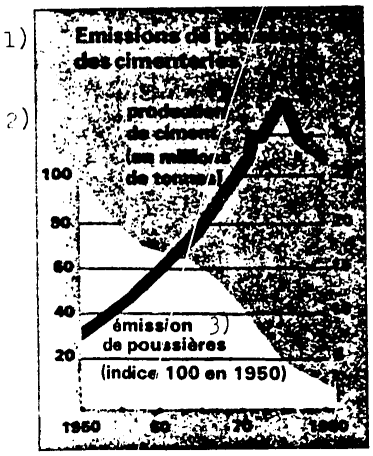
New keynote at the Ministry of Environment: less stations and more collectors. And new stations should even be "light": purification will be accomplished to a greater extent through biological processes which do not consume energy.

But what is already accomplished is often spectacular. The most striking example is the recovery of Lake Annecy. Before the war, oxygenation of the water was maximal to a depth of 30 meters; in 1964, it extended no more than 15 meters. A classical phenomenon: a massive influx of waste supplied food to the lake's algae, particularly the Cyanophyceae, which multiplied and consumed the oxygen. And the "noble" fish began to die of asphyxiation. Trout and salmon had disappeared.

Now they are back. We had only to surround the lake with a circular sewer connected with a purification station. Within a few years Lake Annecy recovered its prewar purity.

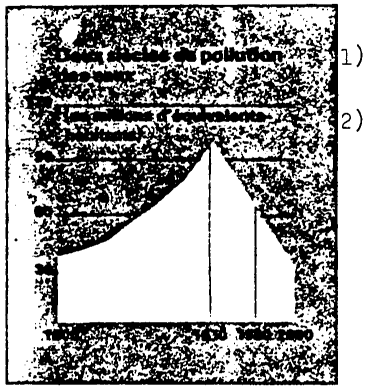
Like all migratory fish, salmon is a striking indication of a stream's purity; to reach the spawning area where it will lay its eggs, far upstream, it must proceed up the river from the estuary. Therefore, it is of little importance for the source to remain pure, if the mouth of the river is poisoned.

The "salmon plan," launched 5 years ago, then assumed that pollution had sufficiently regressed. It was now necessary to "resow" the spawning areas, sometimes clean their gravel and often ban industrial fishing. It was also necessary to build "salmon ladders" to enable the salmon to get over the dams. An elegant solution, discovered somewhat by chance: in Vichy the arrangement of a canoe-kayak run between the water level and the fall became the privileged route of the salmon.



Key:
1. Dust emissions from cement factories
2. Cement production (in millions of tons)
3. Dust emission (index of 100 in 1950)

It took 5 years for this plan to begin to bear fruit: the minimum time for a salmon to return to lay its eggs in the original spawning area. Meanwhile, it will have spent 2 or 3 years in the cold troughs of Greenland at the mercy of fishing boats. (Although part of the salmon "resown" 5 years ago was able to swim upstream, it is probable that another part reached the shelves of supermarkets under the designation "salmon from Denmark.")



Key:
1. Two centuries of water pollution
2. (In millions of inhabitant-equivalents)

A new 5-year plan will be drawn up. This time it will concern all migratory fish: eels, lampreys, sea trout and shad. Also sturgeon. This fish has almost disappeared from the Gironde estuary and from the spawning areas of Bergerac, Marmande or Agen. This year it was necessary to ban sturgeon fishing completely, but that measure is not enough. Here again, the solution is artificial resowing after depollution and cleaning up the spawning areas.

Contacts have been made with specialized Soviet institutions. In any case, it will be a long-term undertaking: a female reaches maturity only when she is 10 or 15 years old.

If we do not lose time, we shall be able to celebrate the year 2000 with caviar from the Gironde.

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